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ABSTRACT

A study was conducted to examine the causal predictors of mass media development in 105 underdeveloped countries for various lengths of time to determine if there were consistent relationships among the dependent and independent variables regardless of the time lag. The study also sought to determine how mass media developed during the 29-year period by examining the strength of predictors at five points in time and by examining the relationships between the strongest predictor and the other independent variables. Results indicated that urbanization and availability of resources were the strongest predictors of mass media development, that education was found to be not as important as had been assumed, that the relationships between mass media development and its predictors differ according to the region of the world studied and with the time period examined, and that urbanism and availability of resources may be reciprocally related over time. (EL)

International Division

A Longitudinal Study of Mass Media Development in Less-Developed Countries

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A Longitudinal Study of Mass Media Development in Less-Developed Countries

> Communication is one of the most pervasive of social relationships; development or modernization is one of the most complex of social changes. Hence, to attempt even a moderately complete discussion of their intersection is premature and probably an act of hubris (Frey, 1973:338).

Despite this somewhat pessimistic observation, studies have investigated the ''intersection'' of mass media and national development for many years. Beginning with the seminal work by Lerner (1958), The Passing of Traditional Society, which investigated the relationship between mass media, urbanization, literacy and political participation, there have been dozens of studies investigating the role of mass media in various aspects of development. For example, Pye (1963) studied the relationship between communication and political development. McCrone**C and Cnudde (1967) were interested in the causal relationships between urbanization , education, communication and democratic political participation. Rogers (1969) studied the role of exposure to mass communication in the modernization of peasants. Inkeles and Smith (1974) have investigated the role of communication in the modernization of the individual. Rogers (1974) examined how mass media could be used in family planning programs. McAnany (1980) edited a volume of studies about the link between communication and agricultural development. And Jussawalla

and Lamberton (1982) and colleagues discuss the role of communication in economic development. Although the description of the effectiveness of mass media in contributing to national development varies from author to author and from perspective to perspective, almost every study makes an explicit or implicit assumption that the mass media are an important (if not central) feature of the national development process.

But one striking characteristic of the mass media and national development studies is that the mass media are rarely investigated as the dependent variable. This is rather surprising given the assumption about the importance of mass media in the development process. If this is a valid assumption, we should expect a great deal of attention directed to the development of mass media themselves in order to understand more fully the nature of this important variable. But this is not the case. In most studies of mass media and national development, mass media are an independent or intervening variable. For example, in development models proposed by both Lerner (1958) and McCrone and Cnudde (1967), mass media is a predictor of political development. In Lerner's model, increases in urbanization lead to increased literacy which is reciprocally related to media growth. Media growth then leads to political participation. McCrone and Cnudde's (1967) model proposed that urbanization leads to increased education which leads to increased mass communication, which finally leads to democratic political participation.

In studies by Weaver (1977) and by Weaver, Buddenbaum and Fair (forthcoming), mass media development is one of six variables examined as predictors of government control of the press. The six variables are accountability of governors, stress on government, availability of resources, urbanism, education and mass media development. The model from

which both these studies proceed predicted that increased availability of resources leads to increased levels of urbanism, and increased levels of urbanism lead to higher levels of education. Higher education then leads to mass media development, which leads to increased accountability of governors, which, finally, leads to decreased control of the media. Increases in the availability of resources also lead to decreased stress on government. Increases in stress on government lead to increased control of the media by government.

Of the handful of studies that treat mass media development as a dependent variable,[1] one by Schramm and Ruggels (1967) represents an important effort to understand how mass media grow in less-developed countries. Underlying the study is the recognition that the mass media variable must be understood fully if it is to be used as one of the key variables in studies of the national development process. Schramm and Ruggels studied data collected for 82 countries for 1950-1 and 1960-1. They were interested in the effect of urbanization, literacy and GNP per capita on the growth of the mass media. They found, using cross-lagged correlations, that for the entire sample of 82 countries, literacy, GNP per capita and urbanization (in that order) were the most important influences on newspaper circulation; and GNP per capita, literacy and urbanization (in that order) were the most important influences on the number of radio receiving sets. When less-developed regions of the world were considered (i.e., Latin America, Middle East, Asia and Sub-Saharan Africa) the researchers found that the pattern of media development in these regions was different not only from the world sample, but also from region to region (Schramm and Ruggels, 1967:27).

Although the Schramm and Ruggels (1967) study represents an important effort towards understanding the mass media variable, it has at least three limitations. First, the use of cross-lagged correlations only reveals whether variables are associated with one another. We can only speculate about how the variables are related causally. Second, the study yields information about only one period of time -- a 10-year span from 1950-1 to 1960-1. Thus, it is possible that the findings are peculiar to 10-year time periods in general, or to the 1950-1 to 1960-1 time period in particular. Third, because the study looks at data from only two points in time, we know that the mass media have grown during the interim time period, but we know nothing about the influences on and the pattern of mass media growth during the interim time period.

The present study, like the Schramm and Ruggels (1967) study, recognizes the importance of understanding the mass media variable and, accordingly, treats it as the dependent variable. The independent variables, borrowed from Weaver (1977), will be accountability of governors, stress on government, level of education, urbanism, availability of resources and government control of media. All but government control of the media are index measures consisting of several indicators. (Refer to Table 1 to see how these variables were constructed.)[2] The data are a collection of economic, social, political and communication-related information for 134 countries measured at six points in time -- 1950 (time 1), 1960 (time 2), 1965 (time 3), 1966 (time 4), 1975 (time 5), and 1979 (time 6). For each time period, therefore, there are a set of independent variables and a dependent variable. The nature of these data collected for a 29-year span allow the researcher to

examine the effect of different periods of time on the relationship between the independent variables and mass media development.

The present study takes the shortcomings of the Schramm and Ruggels study into consideration and first examines the causal predictors of mass media development for time periods of various duration to determine if there are consistent relationships among the dependent and independent variables regardless of the time lag considered. Second, the study tries to determine how mass media developed during the 29-year time period by examining the strength of predictors at five points in time. In other words, as the levels of mass media development change in succeeding time periods, do different independent variables strongly predict the changing levels of mass media development? Third, after determining the strongest predictors of different levels of mass media development, the study examines the relationships between the strongest predictor and the other independent variables.

Method

Factor analysis was used by Weaver (1977) to determine which of the indicators should be used as measures for the variables for 1950, 1960, 1965, and 1966. In the present study, a factor analysis was carried out for the 1975 data only.[3] For 1979, data on some indicators were either missing or uncollected and, therefore, factor analysis was impractical. Table 1 presents the indicators of variables and their factor loadings for each year of data collection. The indicators that loaded highly on a

single factor (with an item-factor correlation between .50 and 1.00) were added together to create a single measure for a given variable.

Table 1 About Here

To check whether the individual indicators used to construct the variables were consistent indicators, Cronbach's alpha was calculated for each constructed variable. Cronbach's alpha represents a conservative estimate of reliability (Heise and Bohrnstedt, 1970:116). Normally, based on Cronbach's alpha, a coefficient of .80 is considered an adequate level for accepting a constructed variable. However, smaller coefficients can be accepted if the technique used to analyze the data is exceptionally robust (as was the technique used in this study).[4] Table 2 reports the Cronbach's alpha associated with each variable for each year of data collection.

Table 2 About Here

To determine which independent variable was the strongest predictor of mass media development for different time periods, multiple regression analysis was used. Given the six different years for which data were collected, 13 different time periods ranging in duration from 1 year [e.g., time 3 (1965) to time 4 (1966)] to 29 years [e.g., time 1 (1950) to time 6 (1979)] were used in the analysis. For each pair of years, the procedure was to regress the media development variable for the later of the pair of years on independent variable for the earlier of the pair.[5]

To determine <u>how</u> mass media developed during the 29-year period, mass media development at time 2 was regressed on the time 1 independent variables (including mass media development at time 1), time 3 mass media development was regressed on the time 2 independent variables (including mass media development at time 2) and so on. The procedure is summarized below:

1950		1960		1965		1966		1975		1979	
IVs (a)	DVs (b)	IVs (c)	DVs (d)	IVs (e)	DVs (f)	IVs (g)	DVs (h)	IVs (i)	DVs (j)	IVs (k)	DVs (l)

Regressions run:

l on i

j on g

h on e

f on c

d on a

This procedure was used to determine whether different independent variables are stronger predictors of the level of mass media development as it changed over time.

Once the best predictors of different levels of mass media development were discovered, these predictors were regressed on the other independent variables. For example, the strongest time 1 (1950) predictor of mass media development at time 2 (1960) was regressed as the time 2 variable on the time 1 (1950) variable (including mass media development at time 1), the strongest time 2 (1960) predictor of mass media development at time 3 (1965) was regressed as the time 3 variable on the time 2 (1960) variables, and so on. This procedure allowed the examination of the relationships among the strongest predictor and the other independent

variables and of how these relationships affect mass media at different levels of development.

Because the problems of national development are particularly relevant to emerging and relatively young nations, the procedures described above were applied to countries categorized as less developed.

Of 137 countries for which data were collected, 105 were categorized as less developed. Categorization was based on the performance of countries on 1979 social and economic indicators of national development such as GNP per capita, number of motor vehicles per capita, school enrollment, number of radios, televisions and newspaper circulation per capita, and level of urbanization.[6] The range of values on each of these indicators was broken down into deciles and each decile was assigned a value between 10 (assigned to the highest values) and 1 (assigned to the lowest values). Then, each country received a score between 10 and 1 for their performance on each indicator. Scores for each indicator were then combined (by adding together all the scores and dividing by the total number of indicators) to create a composite development index score for each country. Thus, a score of 10 indicated the highest level of development, while a score of 1 indicated the lowest level. Countries with composite scores of 8, 9 and 10 were categorized as developed, while countries with composite scores of 5.9 and below were categorized as less developed. Each country with a mid-range score of 6.0 to 7.9 was re-examined and categorized on the basis of its composite score along with considerations of the country's geography (Northern or Southern hemisphere); politics (position on NWIO and NIEO); and economics (status as debtor to IMF or World Bank).

The final categorization of the 137 countries appears in Appendix 1.

Results

Table 3 shows the strongest predictors of mass media development in less-developed countries for time periods of various durations. In all but one time period, urbanization or availability of resources are the strongest predictors of mass media development. Thus, it appears that, in general, there is a consistent relationship among the variables regardless of which part of the 29-year span the time period is taken. In other words, urbanism or availability of resources are the strongest predictors of mass media development in the early part of the time span (e.g., 1950-1960); in the middle part of the time span (e.g., 1965 to 1966); and in the later part of the time span (1966 to 1975).

Table 3 About Here

The exception to this predominant trend is in time period 11 (1960 to 1979) when increased government control of media suppressed mass media development (beta = -.24). The best explanation for this result may be time period itself. Between 1960 and 1979, many countries in the ''third world'' were either newly independent or in the process of breaking away from colonial influence and domination. The immediate desire in many of these countries was rapid national development. Many ''third world'' leaders felt this goal required mobilization of all national resources, including the mass media, for national development. Belief in this philosophy often led governments of less-developed countries to take control of mass media in order to ensure that the use of it was directed toward national development.

If this is a valid argument, then one may ask why a similar result is not evident in other similar time periods such as period 3 (1960 to 1965), period 4 (1960 to 1966) and period 9 (1960 to 1975). Perhaps it is because the effect of government control of media is a phenomenon that requires nearly 20 years to show an impact on the development of mass media.

Table 4 shows the strongest predictors of change in mass media development. The middle column of the table shows the means for mass media development (radios per capita plus newspaper circulation per capita) for succeeding time periods during the 29-year time span. By observing these means we know that the level of mass media development in less-developed countries increased from time period to time period. The third column in Table 4 shows the strongest predictors of mass media development in succeeding time periods, i.e., whether urbanism or availability of resources is the strongest stimulant of changes in mass media development over time.

Table 4 About Here

The findings in Table 4 show that urbanism is the strongest predictor of mass media development between 1950 and 1960. This is not surprising because during this time period most less-developed countries did not have a great deal of financial resources -- certainly not enough to devote much to the development of mass media, though they may have wanted to. As time progressed, however, more resources became available through, among other factors, the development of export-oriented economies and attraction of foreign currency of transnational corporations (TNCs).[7] This change is

reflected in Table 4, as availability of resources becomes the strongest predictor of mass media development between 1960 and 1966. After 1966, the impact of resource availability on mass media development dissipates and urbanism, again, becomes the strongest predictor. The dynamic behind this change could be better ascertained by examining the relationship between the strongest predictors and other independent variables, and the impact of the relationship on mass media development.

A regression procedure revealed that the change in the strongest predictor of mass media development from urbanism to availability of resources was accounted for mainly by increasing urbanism (beta=.68), increased accountability of governors (beta=.41) and rising levels of education (beta=.21). These results suggest that increasingly sophisticated infrastructure that is the result of urbanism, increasing literacy and numeracy that is the result of rising level of education and more responsible economic policies that may be the result of increased accountability of governors are the main reasons that availability of resources becomes the strongest predictor of mass media development between 1960 and 1965. A fourth factor in the shift of strongest predictor of mass media development may have been, as suggested earlier, the activities and influence of TNCs in less-developed countries. (The strongest predictor of availability of resources in 1966 was availability of resources in 1965. The simple correlation was .998 and availability of resources in 1965 explained nearly 75% of the variation in availability of resources in 1966.)

In the time period between 1966 and 1975, there is a shift back to urbanism as the strongest predictor of mass media development. The reason for the shift may be that one of the byproducts of increasing resources in

the previous time periods (1960 to 1965 and 1965 to 1966) was increased investment in telecommunication and transportation sectors (i.e., urbanism). By 1966, the level of urbanism may have been sophisticated enough to support further development of mass media with revenues generated from the telecommunication and transportation sectors, while other resources were invested elsewhere.

Conclusions

This study of mass media development and its predictors suggests several conclusions. First, it seems that the urbanism and availability of resources are the strongest predictors of mass media development regardless of which part of the 29-year time span was considered. In general, varying the length of the time periods did not undermine this observation. This finding reinforces the importance and pervasiveness of economic factors in the development process. Education, however, does not play as important a role in the development of mass media as thought by most researchers. For example, Lerner (1958) and McCrone and Cnudde (1967) proposed that education was the intervening variable between urbanism and mass media development. In this study, education was found to have an effect on mass media development in only one time period (1960 to 1965); and the effect was indirect, working through availability of resources. Further, when 13 different periods of time were considered, education was never the strongest predictor of mass media development. This finding suggests that economic factors may be more important than social concerns in the development of mass media. An implication of this finding is that educational concerns, as an element of national

development, may have to be put off until economic interests and needs are satisfied.

Second, one of Schramm and Ruggels' (1967) conclusions was that the relationships between mass media development and its predictors differ according to the region of the world studied. The results of this study suggest that the relationship between mass media development and its predictors varies with the time period examined as well. However, urbanism or availability of resources are almost always the strongest predictors of mass media development.

Finally, the investigation of the relationship among predictors of mass media development suggests that urbanism and availability of resources may be reciprocally related over time. Urbanism leads to more availability of resources, then availability of resources may lead to further urbanism as time progresses. And at the same time, the relationship between these two variables has an impact on mass media development.

Hopefully, this study has contributed to the understanding of mass media development. To summarize, the study reaffirmed the important influence of economic factors, namely resource availability and infrastructure development (i.e., urbanism), on mass media development. But contrary to earlier studies (e.g., Lerner, 1958; McCrone and Cnudde, 1967), this study found that education may not be as important an influence on mass media development as was thought previously. These findings, along with the complex and shifting relationships between urbanism and availability of resources over time, suggest the need for further study of mass media development. Two issues that deserve special attention are (1) why education does not seem to stimulate mass media

development, and (2) the role of mass media content in mass media development. Future studies should alsoconsider using more variables as predictors, more up-to-date data and, because of the possibility of reciprocal relationships, more sophisticated data analysis techniques.

Notes

[1]Many of these studies define media development as relative media freedom in less-developed countries. Nixon (1960), for example, found, based on data for 85 countries, high correlations between press freedom and three major variables -- income, literacy and newspaper circulation. Later, Nixon (1965) noted similarly high correlations between the number of radio receivers and income, literacy and newspaper circulation. Fagen (1964) hypothesized 1) that growth in the number of radio sets in a country is directly related to its political system; 2) that growth in the number of newspapers is most directly related to literacy and economic development; and 3) that growth in the radio sector is not related to growth in the newspaper sector. Based data collected for 50 countries, hypothesis 1 and 3 were supported and hypothesis 2 was not.

[2]See Weaver (1977:156-164) for a detailed discussio on the construction of these variables.

[3]Data for the following 1975 variables were collected by the author specifically for this study: accountability of governors and stress on government, collected from Gastil (1975) and Taylor and Jodice (1983), respectively. Other 1975 data, along with 1979 data, were previously collected.

[4]See note 5.

[5]This method is an elaboration of a design for multivariate two-wave panel data suggested by Heise (1970:7). One of the major advantages of the design is its robustness. Although ideally a number of assumptions must be met before applying the technique, Hiese shows with simulated data that violating even the most stringent of the assumptions (those involving perfect measurement and uncorrelated error terms) is not a serious problem. Using Heise's design, the causal pattern among variables can be inferred even from biased parameter estimates that may result from the violation of assumptions (Heise, 1970:26).

[6]This scheme and procedure and the final categorization of countries is taken directly from Fair (1984).

[7]For an excellent discussion on the activities of TNCs in less-developed countries, see Blake and Walters (1983:83-133).

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TABLE 1

Variable Construction: Factor Loadings for Indicators of Variables

Variable / Indicators	Factor Loadings 1950	1960	1965	1966	1975	1979
Accountability of Governors						
a. selection of effective executives	.71	.62	.50	.62	X	X
b. effectiveness of legislature	.69	.69	.74	.62	X	X
c. competitiveness of legislative nominating process	.90	.88	.90	.84	X	X
d. competition index score	.79	.86	.89	.79	X	X
e. civil rights index (Gastil, 1975)	X	X	X	X	.93	X
f. political rights index (Gastil, 1975)	X	X	X	X	.89	X
g. accountability index (Gastil, 1980)	X	X	X	X	X	*
Stress on Government						
a. number of revolutions	-	.44	.90	.57	X	X
b. number of protest demonstrations	-	-	-	-	1.00	X
c. number of riots	-	.75	-	.53	.85	X
d. number of armed attacks	.72	.62	.77	.58	-	X
e. number of deaths from domestic violence	.71	-	.75	-	-	X
f. government sanctions in response to perceived threats	-	.54	.75	.68	.89	X
g. stress index (Gastil, 1980)	X	X	X	X	X	*
Mass Media Development						
a. number of radio sets per capita	.86	.89	.77	73	.77	.75
b. newspaper circulation per capita	.81	.86	.71	.79	.78	.77
Level of Education						
a. primary and secondary school enrollment per capita	.85	.80	92	.82	*	*
b. total school enrollment per capita	.84	.80	.92	.81	X	X

TABLE 1 - Continued

Variable / Indicators	Factor Loadings 1950	1960	1965	1966	1975	1979
Urbanism						
a. mail per capita	.84	.85	.75	.82	X	X
b. telephones per capita	.91	.90	.82	.89	*	*
c. highway vehicles per capita	.84	.86	.87	.90	X	X
Availability of Resources						
a. GNP per capita	-	.90	.89	.85	.98	*
b. GDP per capita	.93	.95	.89	.85	1.00	X
c. energy consumption per capita	.93	.92	.92	.88	-	X
d. revenue per capita	.87	.93	.89	.86	X	X

Factor loadings are based on principle factor analysis with Varimax rotation.

Government control of media is a single indicator for every year of data collection. The variable was represented by scales developed by the following researchers:

1950: Schramm and Carter (1980)

1960: Nixon (1960)

1965: Nixon (1965)

1966: Lowenstein (1967) (modified by Kent, [1972])

1975: Sussman and Gastil (1972)

1979: Gastil (1980)

- indicates that the indicator did not load clearly on one factor and, therefore, the indicator was not used in constructing the variable.

* indicates that only a single indicator was used for the variable.

X indicates that data on the indicator was not collected or was collected but not used in this study.

TABLE 2

Reliability Coefficients: Cronbach's Alpha for Constructed Variables

Variable	Year					
	1950	1960	1965	1966	1975	1979
Government Control of Media	*	*	*	*	*	*
Accountability of Governors	.92	.88	.89	.90	.92	*
Stress on Government	.51	.63	.77	.79	.85	*
Media Development	.85	.79	.66	.63	.76	.59
Level of Education	.99	.99	.98	.98	*	*
Urbanism	.85	.93	.86	.89	*	*
Availability of Resources	.92	.90	.96	.94	.99	*

* Indicates that a single indicator was used for the variable.

TABLE 3

Strongest Predictors of Mass Media Development
for 13 Time Periods

	IVs from	Mass Media Devel. in	Duration of Period (yrs.)	Best Predictor	Beta
1.	1965	1966	1	availability of resources	.22
2.	1975	1979	4	---[a]	---[a]
3.	1960	1965	5	availability of resources	2.44
4.	1960	1966	6	availability of resources	.18
5.	1966	1975	9	urbanism	1.36
6.	1950	1960	10	urbanism	.47 *
7.	1966	1979	13	urbanism	.33
8.	1965	1979	14	urbanism	.23
9.	1960	1975	15	urbanism	.25
10.	1950	1966	16	---[a]	---[a]
11.	1960	1979	19	government control/media	-.24
12.	1950	1975	25	---[a]	---[a]
13.	1950	1979	29	urbanism	2.30

* ($p = .02$)

[a] uninterpretable regression results

TABLE 4

Strongest Predictors of Changes
in Mass Media Development

Time Period		Mass media devel. at time B (means)	Best predictor from time A of mass media devel./time B	Beta
A	B			
1. 1950	1960	1229.6	urbanism	.47*
2. 1960	1965	1608.0	availability of resources	2.44
3. 1965	1966	1786.5	availability of resources	.22
4. 1966	1975	2003.0	urbanism	1.36
5. 1975	1979	2392.0	---[a]	---

* (p = .02)

[a] uninterpretable regression results

Appendix 1

Categorization of Countries

Developing Nations (N = 105)

Afghanistan
Albania
Algeria
Bolivia
Botswana
Brazil
Burma
Cameroon
Central African Republic
Ceylon (Sri Lanka)
Chad
Chile
China
Colombia
Congo
Costa Rica
Cyprus
Dahomey (Benin)
Dominican Republic
El Salvador
Ethiopia
Gabon
Gambia
Ghana
Guatemala
Guinea
Guyana
Haiti
Honduras
India
Indonesia
Iran
Iraq
Ivory Coast
Jamaica
Jordan
Kenya
North Korea
South Korea
Lesotho
Liberia
Madagascar
Malawi
Malaysia
Maldives Islands
Mali
Malta
Mauritania
Mexico
Mongolia
Morocco
Mozambique
Nepal
Nicaragua
Niger
Nigeria
Pakistan
Paraguay
Peru
Philippines
Puerto Rico
Rhodesia (Zimbabwe)
Rwanda
Saudi Arabia
Senegal
Sierra Leone
South Yemen
Sudan
Tanzania
Thailand
Togo
Tunisia
Turkey
Uganda
United Arab Republic
Upper Volta (Bourkina Fasso)
Samoa
Yemen
Zambia
Argentina
Barbados
Cuba
Ecuador
Hong Kong
Kuwait
Laos
Lebanon
Panama
Singapore
Syria
Trinidad and Tobago
Venezuela
Cambodia
Papua Guinea
New Guinea
Somalia
Taiwan
North Vietnam
South Vietnam
Zanzibar

Developed Nations (N = 32)

Australia
Austria
Belgium
Bulgaria
Canada
Denmark
Finland
France
East Germany (GDR)
West German (FRG)
Iceland
Japan
Netherlands
New Zealand
Norway
Spain
Sweden
Switzerland
United Kingdom
United States
Greece
Poland
Portugal
Czechoslovakia
Hungary
Ireland
Israel
Italy
Luxembourg
Romania
Yugoslavia
Soviet Union
South Africa